

Claims

1. Method for use in establishing a radio bearer (RB) relating to a request from a core network (CN) to a radio access network (RAN) in a mobile telecommunications system (UMTS), comprising the steps of:

determining (102) that a requested mode for an interface between said CN and said RAN is a transparent mode and signaling a segmentation state indicator to a segmentation/reassembly layer of said RAN; and

in response to said segmentation state indicator, blocking (110) segmentation in said RLC layer of said RAN for said RB in case said indicator indicates an inactive segmentation state and permitting (108) segmentation in said segmentation/reassembly layer of said RAN in case said indicator indicates an active segmentation state.

2. The method of claim 1, in case said segmentation is blocked in said RAN for an RB downlink, further comprising the steps of:

storing (174) plural service data units (SDUs) under the control of the segmentation/reassembly layer in said RAN, each SDU provided from the CN in a minimum interleaving period in said transparent mode;

retrieving said stored plural SDUs and providing (180) said retrieved plural SDUs in one or more protocol data units (PDUs) in one or more data transport blocks; and

providing (182) said one or more data transport blocks with a transport format indicator (TFI) for transmission over a radio interface from said RAN to a user equipment (UE) in a transmission time interval (TTI)

having a duration greater than said minimum interleaving period.

5 3. The method of claim 2, further comprising the steps of:
 receiving (265) said PDUs from said transport blocks at a segmentation/reassembly layer of said UE; and
 providing said fixed-size data SDUs to a layer of said UE above said segmentation/reassembly layer.

10

 4. The method of claim 1, in case said segmentation is blocked in said RAN for an RB uplink, further comprising the steps of:
 storing plural service data units (SDUs) at a
15 segmentation/reassembly layer in said UE, each SDU provided (278) in a minimum interleaving period in said transparent mode;
 retrieving said stored plural SDUs and
 providing (306) said retrieved plural SDUs in one or more
20 protocol data units (PDUs) in one or more transport blocks; and
 providing (314) said one or more transport blocks with a transport format indicator (TFI) for transmission over a radio interface from said UE to said
25 RAN in a transmission time interval (TTI) having a duration greater than said minimum interleaving period.

5. The method of claim 4, further comprising the steps of:

receiving said one or more transport blocks with TFI at a medium access control (MAC) layer of said RAN;

extracting said PDUs from said transport blocks at said MAC layer of said RAN;

providing (324) said PDUs from said MAC layer of said RAN to a segmentation/reassembly layer of said RAN;

storing said PDUs at said segmentation/reassembly layer of said RAN;

extracting said fixed-size SDUs from said stored PDUs; and

providing (334) said fixed-size SDUs from said RAN to said CN over said interface.

6. Method for handling fixed-size service data units (SDUs) in a downlink from a core network of a mobile telecommunications system by a radio access network (RAN) of said system, comprising the steps of:

storing plural SDUs at a radio link control segmentation/reassembly layer in said RAN, each SDU provided in a minimum interleaving period in a transparent mode;

retrieving said stored plural SDUs and providing said retrieved plural SDUs in one or more protocol data units (PDUs) in one or more data transport blocks; and

providing said one or more data transport blocks with a transport format indicator (TFI) for transmission over a radio interface from said RAN to a user equipment (UE) in a transmission time interval (TTI)

having a duration greater than said minimum interleaving period.

7. The method of claim 6, further comprising the
5 steps of:

receiving said one or more data transport
blocks with TFI at a medium access control (MAC) layer of
said UE;

extracting said PDUs from said transport blocks
10 at a segmentation/reassembly layer of said UE; and
providing said fixed-size data SDUs to a layer
of said UE above said segmentation/reassembly layer.

8. Method for handling fixed-size service data
15 units (SDUs) in an uplink from a user equipment (UE) of a
mobile telecommunications system via an interface to a
radio access network (RAN) and from the RAN via an
interface to a core network (CN) of said system,
comprising the steps of:

20 storing plural SDUs at a
segmentation/reassembly layer in said UE, each SDU
provided in a minimum interleaving period in a
transparent mode;

retrieving said stored plural SDUs and
25 providing said retrieved plural SDUs in one or more
protocol data units (PDUs) in one or more transport
blocks; and

providing said one or more transport blocks
with a transport format indicator (TFI) for transmission
30 over a radio interface from said UE to said RAN in a
transmission time interval (TTI) having a duration
greater than said minimum interleaving period.

9. The method of claim 8, further comprising the steps of:

receiving said one or more transport blocks with TFI at a medium access control (MAC) layer of said RAN;

extracting said PDUs from said transport blocks at said MAC layer of said RAN;

providing said PDUs from said MAC layer of said RAN to a segmentation/reassembly layer of said RAN;

storing said PDUs at said segmentation/reassembly layer of said RAN;

extracting said fixed-size SDUs from said stored PDUs; and

providing said fixed-size SDUs from said RAN to said CN over said interface to the CN.

10. Apparatus for use in establishing a radio bearer (RB) relating to a request from a core network (CN) to a radio access network (RAN) in a mobile telecommunications system (UMTS), comprising:

means for determining (220) that a requested mode for an interface between said CN and said RAN is a transparent mode and for signaling (223) a segmentation state indicator to a segmentation/reassembly layer of said RAN; and

means (234) responsive to said segmentation state indicator, for blocking segmentation in said segmentation/reassembly layer of said RAN for said RB in case said indicator indicates an inactive segmentation state and for permitting (108) segmentation in said segmentation/reassembly layer of said RAN in case said indicator indicates an active segmentation state.

11. The apparatus of claim 10, in case said segmentation is blocked in said RAN for an RB downlink, further comprising:

means for storing (178) plural service data
5 units (SDUs) under the control of the
segmentation/reassembly layer in said RAN, each SDU
provided from the CN in a minimum interleaving period in
said transparent mode and for providing (180) said stored
plural SDUs in one or more protocol data units (PDUs) in
10 one or more data transport blocks; and

means for providing (182, 238) said one or more
data transport blocks with a transport format indicator
(TFI) for transmission over a radio interface from said
RAN to a user equipment (UE) in a transmission time
15 interval (TTI) having a duration greater than said
minimum interleaving period.

12. The apparatus of claim 11, further comprising:

means for receiving (256) said PDUs from said
20 transport blocks at a medium access control (MAC) layer
of said UE; and

means at a segmentation/reassembly layer of
said UE (260) responsive to said PDUs from said MAC
layer, for providing said fixed-size data SDUs to a layer
25 of said UE above said segmentation/reassembly layer.

13. The apparatus of claim 10, in case said segmentation is blocked in said RAN for an RB uplink, further comprising:

means (280) for storing plural service data
5 units (SDUs) at a segmentation/reassembly layer in said UE, each SDU provided (278) in a minimum interleaving period in said transparent mode and for retrieving said stored plural SDUs for providing (306) said retrieved plural SDUs in one or more protocol data units (PDUs) in
10 one or more transport blocks; and
means (310) for providing (312, 314) said one or more transport blocks with a transport format indicator (TFI) for transmission over a radio interface from said UE to said RAN in a transmission time interval
15 (TTI) having a duration greater than said minimum interleaving period.

14. The apparatus of claim 13, further comprising:

means (328) for receiving said one or more
20 transport blocks with TFI at a medium access control (MAC) layer of said RAN for extracting said PDUs from said transport blocks at said MAC layer of said RAN, and for providing (324) said PDUs from said MAC layer of said RAN to a segmentation/reassembly layer of said RAN; and
25 means (326) for storing said PDUs at said segmentation/reassembly layer of said RAN for extracting said fixed-size SDUs from said stored PDUs and for providing (334, 336) said fixed-size SDUs from said RAN to said CN over said interface between said RAN and said
30 CN.

15. Apparatus for handling fixed-size service data units (SDUs) in a downlink from a core network of a mobile telecommunications system by a radio access network (RAN) of said system, comprising:

- 5 means (234) for storing plural SDUs at a segmentation/reassembly layer in said RAN, each SDU provided in a minimum interleaving period in a transparent mode for retrieving said stored plural SDUs and for providing said retrieved plural SDUs in one or more protocol data units (PDUs) in one or more data transport blocks; and
- 10 means (238) for providing said one or more data transport blocks with a transport format indicator (TFI) for transmission over a radio interface from said RAN to
- 15 a user equipment (UE) in a transmission time interval (TTI) having a duration greater than said minimum interleaving period.

16. The apparatus of claim 15, further comprising:
- 20 means (256) for receiving said one or more data transport blocks with TFI at a medium access control (MAC) layer of said UE; and
- means (260) for extracting said PDUs from said transport blocks at a segmentation/reassembly layer of
- 25 said UE and for providing said fixed-size data SDUs to a layer (L3) of said UE above said segmentation/reassembly layer.

17. Apparatus for handling fixed-size service data units (SDUs) in an uplink from a user equipment (UE) of a mobile telecommunications system via a radio interface (320) to a radio access network (RAN) and from the RAN via an interface (333) to a core network (CN) of said system, comprising:

means (280) for storing plural SDUs at a segmentation/reassembly layer in said UE, each SDU provided in a minimum interleaving period in a transparent mode for retrieving said stored plural SDUs and providing said retrieved plural SDUs in one or more protocol data units (PDUs) in one or more transport blocks; and

means (310) for providing said one or more transport blocks with a transport format indicator (TFI) for transmission over said radio interface from said UE to said RAN in a transmission time interval (TTI) having a duration greater than said minimum interleaving period.

18. The apparatus of claim 17, further comprising:

means (328) for receiving said one or more transport blocks with TFI at a medium access control (MAC) layer of said RAN for extracting said PDUs from said transport blocks at said MAC layer of said RAN and for providing said PDUs from said MAC layer of said RAN to a segmentation/reassembly layer of said RAN; and

means (326) for storing said PDUs at said segmentation/reassembly layer of said RAN for extracting said fixed-size SDUs from said stored PDUs and for providing said fixed-size SDUs from said RAN to said CN over said interface from said RAN to said CN.